Notice of Allowability	Application No.	Applicant(s)	
	09/827,310	CHAN ET AL.	
	Examiner	Art Unit	
	Joseph S. Del Sole	1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *5/20/04*.

2. ☒ The allowed claim(s) is/are *1,3-11,13-20,22-29,31-36,39-53 and 55-58*.

3. ☒ The drawings filed on *06 April 2001* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted..
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee. The Applicant was not contacted because no changes were made to the claims other than a mere correction of the improper claim identifiers ("previously amended" is not proper, but "previously presented" is).

The application has been amended as follows:

replace the claims with the following listing of claims:

1. (original) An extrusion die for use in an apparatus to produce multi-layered pipes, the extrusion die comprising:

(a) a first and second die assembly, each die assembly comprising:

(i) an extrusion head having a central bore and a lateral opening for receiving an extrudate;

(ii) a nozzle, operably connected to the extrusion head, the nozzle having an outer die lip at a free end of the nozzle;

(iii) a hollow mandrel coaxially located in the central bore,

(iv) an inner mandrel coaxially located in the hollow mandrel and in the nozzle, the inner mandrel having an inner die lip at a free end of the inner mandrel; the inner die lip and outer die lip defining a die gap; and

(v) the nozzle and inner mandrel defining a layer-forming channel in fluid communication with the lateral opening and the die gap;

wherein a central portion of the nozzle of the second die assembly is co-axially located within the inner mandrel of the first die assembly such that the nozzle of the second die assembly and the inner mandrel of the first die assembly define an air space.

2. (cancelled)

3. (original) The extrusion die of claim 1, further comprising means for moving the second die assembly longitudinally within the inner mandrel of the first die assembly, thereby altering a longitudinal distance between the die gap of the first die assembly and the die gap of the second die assembly.

4. (original) The extrusion die of claim 1, further comprising means near the extrusion head for moving the inner die lip longitudinally, thereby altering the size of the die gap.

5. (original) The extrusion die of claim 1, further comprising a spacer located in the air space.

6. (original) The extrusion die of claim 5, wherein the spacer comprises openings through which air can be introduced.

7. (original) The extrusion die of claim 1, further comprising a spiral disposed in a location downstream of the first and second die assembly.

8. (original) The extrusion die of claim 1, wherein the extrusion head, nozzle, outer die lip and inner die lip of each of said first and second die assemblies include electrical heaters and thermal sensors.

9. (original) The extrusion die of claim 1, further comprising a third die assembly as defined in (a), wherein a central portion of the nozzle of the third die assembly is co-axially located within the inner mandrel of the second die assembly, such that the nozzle of the third die assembly and the inner mandrel of the second die assembly define a second air space.

10. (original) The extrusion die of claim 1, further comprising a vacuum cooling mandrel disposed in a location downstream from said first and second die assemblies, said vacuum cooling mandrel comprising a single cooling channel and multiple vacuum ports, said multiple vacuum ports disposed along an outer surface of the cooling mandrel.

11. (previously ~~amended~~ presented) The extrusion die of claim 10, wherein said vacuum ports further comprise vacuum port holes for independent regulation of vacuum pressure within each vacuum port.

12. (cancelled)

13. (original) The extrusion die of claim 3, further comprising means near the extrusion head for moving the inner die lip longitudinally, thereby altering the size of the die gap.

14. (original) The extrusion die of claim 3, further comprising a spacer located in the air space.

15. (original) The extrusion die of claim 14, wherein the spacer comprises openings through which air can be introduced.

16. (original) The extrusion die of claim 3, further comprising a spiral disposed in a location downstream of the first and second die assembly.

17. (original) The extrusion die of claim 3, wherein the extrusion head, nozzle, outer die lip and inner die lip of each of said first and second die assemblies include electrical heaters and thermal sensors.

18. (original) The extrusion die of claim 3, further comprising a third die assembly as defined in (a), wherein a central portion of the nozzle of the third die assembly is co-axially located within the inner mandrel of the second die assembly, such that the nozzle of the third die assembly and the inner mandrel of the second die assembly define a second air space.

19. (original) The extrusion die of claim 3, further comprising a vacuum cooling mandrel disposed in a location downstream from said first and second die assemblies, said vacuum cooling mandrel comprising a single cooling channel and multiple vacuum ports, said multiple vacuum ports disposed along an outer surface of the cooling mandrel.

20. (previously ~~amended~~ presented) The extrusion die of claim 19, wherein said vacuum ports further comprise vacuum port holes for independent regulation of vacuum pressure within each vacuum port.

21. (cancelled)

22. (original) The extrusion die of claim 4, further comprising a spacer located in the air space.

23. (original) The extrusion die of claim 22, wherein the spacer comprises openings through which air can be introduced.

24. (original) The extrusion die of claim 4, further comprising a spiral disposed in a location downstream of the first and second die assembly.

25. (original) The extrusion of claim 4, wherein the extrusion head, nozzle, outer die lip and inner die lip of each of said first and second die assembly include electrical heaters and thermal sensors.

26. (original) The extrusion die of claim 4, further comprising a third die assembly as defined in (a), wherein a central portion of the nozzle of the third die assembly is co-axially located within the inner mandrel of the second die assembly, such that the nozzle of the third die assembly and the inner mandrel of the second die assembly define a second air space.

27. (original) The extrusion die of claim 4, further comprising a vacuum cooling mandrel disposed in a location downstream from said first and second die assemblies, said vacuum cooling mandrel comprising a single cooling channel and multiple vacuum ports, said multiple vacuum ports disposed along an outer surface of the cooling mandrel.

28. (previously presented) The extrusion die of claim 27, wherein said vacuum ports further comprise vacuum port holes for independent regulation of vacuum pressure within each vacuum port.

29. (original) An extrusion die for use in an apparatus to produce multi-layered pipes, the extrusion die comprising:

(a) a first and second die assembly, each die assembly comprising:

(i) an extrusion head having a central bore and a lateral opening for receiving an extrudate;

(ii) a nozzle operably connected to the extrusion head, the nozzle having an outer die lip at a free end of the nozzle;

(iii) a hollow mandrel coaxially located in the central bore,

(iv) an inner mandrel coaxially located in the hollow mandrel and in the nozzle, the inner mandrel having an inner die lip at a free end of the inner mandrel; the inner and outer die lips defining a die gap; and

(v) the nozzle and inner mandrel defining a layer-forming channel in fluid communication with the lateral opening and the die gap;

wherein a central portion of the nozzle of the second die assembly is co-axially located within the inner mandrel of the first die assembly.

30. (cancelled)

31. (original) The extrusion die of claim 29, further comprising means near the extrusion head for moving the inner die lip longitudinally, thereby altering the size of the die gap.

32. (original) The extrusion die of claim 29, further comprising a spiral disposed in a direction downstream of the first and second die assembly.

33. (original) The extrusion die of claim 29, wherein the extrusion head, nozzle, outer die lip and inner die lip of each of said first and second die assembly include electrical heaters and thermal sensors.

34. (original) The extrusion die of claim 29, further comprising a third die assembly as defined in (a), wherein a central portion of the nozzle of the third die assembly is co-axially located within the inner mandrel of the second die assembly.

35. (original) The extrusion die of claim 29, further comprising a vacuum cooling mandrel disposed downstream from said first and second die assemblies, said vacuum cooling mandrel comprising a single cooling channel and multiple vacuum ports, said multiple vacuum ports disposed along an outer surface of the cooling mandrel.

36. (previously presented) The extrusion die of claim 35, wherein said vacuum ports further comprise vacuum port holes for independent regulation of vacuum pressure within each vacuum port.

37. (cancelled)

38. (cancelled)

39. (original) A method for preparing a multi-layered pipe using the extrusion die of claim 1, wherein said method includes the steps of:

(a) introducing under pressure a first extrudate into the lateral opening of the first die assembly and introducing a second extrudate into the lateral opening of the second die assembly;

(b) passing said first and second extrudates through said first and second layer-forming channels; and,

(c) receiving said first extrudate from the die gap of the first die assembly and receiving the second extrudate from the die gap of the second die assembly.

40. (original) The method of claim 39, wherein the first extrudate has a different temperature profile than the second extrudate.

41. (original) The method of claim 39, further comprising the step of adjusting the longitudinal distance between the die gap of the first die assembly and the die gap of the second die assembly by moving the second die assembly longitudinally within the inner mandrel of the first die assembly.

42. (original) The method of claim 39, further comprising the step of introducing air pressure into the air space.

43. (original) The method of claim 39, wherein the extrusion die further comprises means near the extrusion head for moving the inner die lip longitudinally, said method comprising the additional step of altering the size of the die gap by using said means.

44. (original) The method of claim 39, wherein the extrusion die further comprises a vacuum cooling mandrel disposed in a location downstream from said first and second die assemblies, said vacuum cooling mandrel comprising a single cooling channel and multiple vacuum ports, said multiple vacuum ports disposed along an outer surface of the cooling mandrel.

45. (original) The method of claim 44, further comprising the step of shaping the second extrudate using the vacuum cooling mandrel.

46. (original) The method of claim 45, further comprising the step of introducing a vacuum through said vacuum ports.

47. (previously ~~amended~~ presented) A method for preparing a multi-layered pipe using the extrusion die of claim 29, wherein said method includes the steps of:

(a) introducing under pressure a first extrudate into the lateral opening of the first die assembly and introducing a second extrudate into the lateral opening of the second die assembly;

(b) passing said first and second extrudates through said first and second layer-forming channels; and,

(c) receiving said first extrudate from the die gap of the first die assembly and receiving the second extrudate from the die gap of the second die assembly.

48. (original) The method of claim 47, wherein the first extrudate has a different temperature profile than the second extrudate.

49. (original) The method of claim 47, further comprising the step of adjusting the longitudinal distance between the die gap of the first die assembly and the die gap of the second die assembly by moving the second die assembly longitudinally within the inner mandrel of the first die assembly.

50. (original) The method of claim 47, wherein the extrusion die further comprises means near the extrusion head for moving the inner die lip longitudinally, said method comprising the additional step of altering the size of the die gap by using said means.

51. (original) The method of claim 47, wherein the extrusion die further comprises a vacuum cooling mandrel disposed in a location downstream from said first and second die assemblies, said vacuum cooling mandrel comprising a single cooling channel and multiple vacuum ports, said multiple vacuum ports disposed along an outer surface of the cooling mandrel.

52. (original) The method of claim 51, further comprising the step of shaping the second extrudate using the vacuum cooling mandrel.

53. (original) The method of claim 52, further comprising the step of introducing a vacuum through said vacuum ports.

54. (cancelled)

55. (previously presented) An extrusion die for use in an apparatus to produce multi-layered pipes, the extrusion die comprising:

(a) a first and second die assembly, each die assembly comprising:

(i) an extrusion head having a central bore and a lateral opening for receiving an extrudate;

(ii) a nozzle, operably connected to the extrusion head, the nozzle having an outer die lip at a free end of the nozzle;

(iii) a hollow mandrel coaxially located in the central bore,

(iv) an inner mandrel coaxially located in the hollow mandrel and in the nozzle, the inner mandrel having an inner die lip at a free end of the inner mandrel; the inner die lip and outer die lip defining a die gap; and

(v) the nozzle and inner mandrel defining a layer-forming channel in fluid communication with the lateral opening and the die gap;

wherein a central portion of the nozzle of the second die assembly is co-axially located within the inner mandrel of the first die assembly such that the nozzle of the second die assembly and the inner mandrel of the first die assembly define an air space; and,

wherein the air space allows a first extrudate in the layer-forming channel of the first die assembly to be at a temperature different than a second extrudate in the layer-forming channel of the second die assembly.

56. (previously presented) The extrusion die of claim 55 further comprising means for moving the second die assembly longitudinally within the inner mandrel of the first die assembly, thereby altering a longitudinal distance between the die gap of the first die assembly and the die gap of the second die assembly.

57. (previously presented) The extrusion die of claim 55 further comprising means near the extrusion head for moving the inner die lip longitudinally, thereby altering the size of the die gap.

58. (previously presented) An extrusion die for use in an apparatus to produce multi-layered pipes, the extrusion die comprising:

(a) a first and second die assembly, each die assembly comprising:

(i) an extrusion head having a central bore and a lateral opening for receiving an extrudate;

(ii) a nozzle operably connected to the extrusion head, the nozzle having an outer die lip at a free end of the nozzle;

(iii) a hollow mandrel coaxially located in the central bore,

(iv) an inner mandrel coaxially located in the hollow mandrel and in the nozzle, the inner mandrel having an inner die lip at a free end of the inner mandrel; the inner and outer die lips defining a die gap; and

(v) the nozzle and inner mandrel defining a layer-forming channel in fluid communication with the lateral opening and the die gap;

wherein a central portion of the nozzle of the second die assembly is co-axially located within the inner mandrel of the first die assembly, and

wherein a first extrudate in the layer-forming channel of the first die assembly is at a temperature different than a second extrudate in the layer-forming channel of the second die assembly.

Allowable Subject Matter

2. The following is an examiner's statement of reasons for allowance: the prior art of record fails to teach or suggest the invention for the reasons set forth in the Office action of 10/14/03.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Correspondence

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Joseph S. Del Sole whose telephone number is (571) 272-1130. The examiner can normally be reached on Monday through Friday from 8:30 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Wanda Walker, can be reached at (571) 272-1151. The official fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for both non-after finals and for after finals.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from the either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 886-217-9197 (toll-free).

Joseph S Del Sole

J.S.D.
June 2, 2004

ROBERT DAVIS
PRIMARY EXAMINER
GROUP ~~1300~~ 1700

6/3/04